

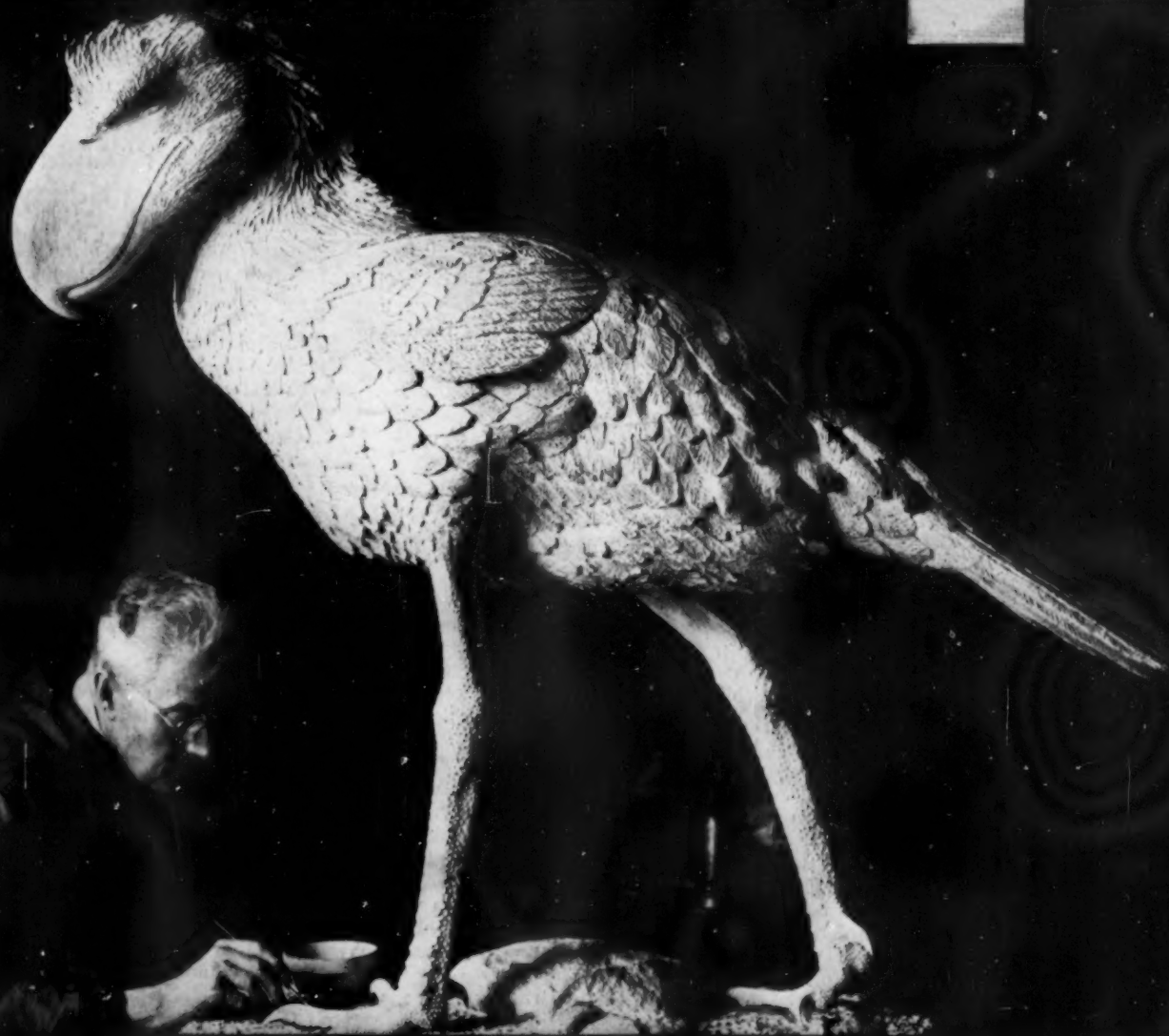
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OCTOBER 2, 1948

TECHNOLOGY DEPARTMENT

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Terror Bird

See Page 218

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VOL. 54 NO. 14

## VETERINARY MEDICINE

# Polio Clues from Pigs

**Striking similarity has been found between the disease which is attacking pigs in Europe and human polio. This may aid research on virus.**

► **NEW CLUES** for research on infantile paralysis may come from a disease which is taking a high toll of pigs in Europe.

The virus that causes porcine virus encephalomyelitis in swine may be a relative of the human polio virus. This is suggested by Dr. Martin M. Kaplan, veterinary consultant to the Food and Agriculture Organization of the United Nations, and Dr. David R. Meranze of Mt. Sinai Hospital, Philadelphia, in a report to the journal, *VETERINARY MEDICINE* (Aug.).

Striking similarity between the two diseases—in the way they strike the body and affect the community or herd—was noted by Dr. Kaplan last year in Czechoslovakia where he studied the swine scourge.

Both diseases attack the central nervous system. Slight infection develops an immunity. Transmission is probably through the digestive tract, and also through the nasal route in the pig disease. The viruses are rarely found in the blood, and the

early stages of both diseases are marked by hyper-irritability, with paralysis most commonly involving the lower limbs.

The swine virus encephalomyelitis creates inflammation of the brain and spinal cord. Thus far, the disease has not been detected in this country, but it is considered a major threat to European pork supplies. The disease spread rapidly on the European continent during World War II.

European scientists, the American report said, have noticed the parallel between the human disease and the pig infection. But no human cases of polio have been associated with the disease in swine.

Virus of one other disease, mouse poliomyelitis, may also come from the same parent strain, it was indicated.

Drs. Kaplan and Meranze urged that scientists in this country study the swine disease both because of the possibility that it might reach this country and because of the similarity to polio virus.

*Science News Letter, October 2, 1948*

## AGRICULTURE

# Vegetables Kept Fresh

► **FRESH VEGETABLES** that stay fresh, even after lying in the open for more than a week, are the newest prospect held forth by U. S. Department of Agriculture research on plant growth control substances. Results of preliminary experiments pointing in this direction were disclosed when the National Advisory Committee on the Research and Marketing Act visited the great experiment station at Beltsville, Md., near Washington.

It all started with some crippled bean plants, bent over into permanent humps when a growth-control chemical related to 2,4-D was applied to one of the leaves. Examination showed that the lopsided growth was due to the rapid enlargement of cells on one side of the stem. The cells stubbornly held onto the water they had quickly taken up, making the deformation permanent.

Dr. John W. Mitchell, in charge of the research, figured that if the chemical would make stem cells hang onto water, it might do the same for the green bean pods, thereby postponing their wilting.

A plot of bean plants was therefore sprayed with a dilute solution of the compound, shortly before the beans were ready to be picked. After they were picked, some

of the pods were left lying in the open, in the warm atmosphere of the greenhouse. Along with them were left an equal number of similar pods from untreated plants. After nine days the beans from the sprayed plants were still plump and fresh-looking, while those from the unsprayed control plants were as wilted and weary-looking as you would expect nine-day-old green beans to be.

The method is not ready for recommendation to truck gardeners, Dr. Mitchell stated. Further work must be carried on, to determine the best chemicals and the best concentrations to use, as well as to learn possible applications to green peppers, tomatoes, peas and other vegetables that might be benefited by a wilt-prevention treatment.

*Science News Letter, October 2, 1948*

## BIOCHEMISTRY

# Streptomycin Checks Plant-Cell Growths

► **STREPTOMYCIN**, killer of many germs causing human ills, prevents the kind of plant tumor known as crown gall. This is not because it is specific against the formation of gall tissue but because it has a

tendency to check any kind of plant-cell growth, in the opinion of Dr. R. S. de Ropp of the New York Botanical Garden.

Dr. de Ropp found that when he treated with streptomycin pieces of carrot inoculated with crown-gall germs within a couple of days after inoculation, the galls failed to develop. But the germ-killer also prevented the development of roots, whose growth had been started with the growth-promoting hormone, indole acetic acid.

He reached the conclusion, therefore, that "It seems more probable that streptomycin is a general inhibitor of the growth of embryonic plant tissue than a specific inhibitor of tumor tissue. Its effect on tumor formation is probably due to its action on the bacterial inciting agent."

Dr. de Ropp described his experiments in the British scientific journal, *NATURE* (Sept. 18).

*Science News Letter, October 2, 1948*

## PSYCHOLOGY

# "Planned-For" Child Is Not Always Happy

► **A CHILD** that is "planned-for" by its parents is not necessarily happy and secure.

Psychologists have realized that an "unwanted" child starts life under a handicap. But planned-for children have their own problems too, Dr. Sophie Schroeder Sloman of the Institute for Juvenile Research in Chicago found.

One out of eight of the problem children sent to that clinic had been definitely planned for, the psychologist discovered, a total of 62 in all. And some were so unhappy that they had actually threatened suicide.

Many of these children had been deliberately brought into the world in the hope of saving the wreck of an unhappy marriage. It didn't work and when the baby could not bring peace to the parents they didn't want him any more. The old-fashioned remedy for marital difficulties, "a little one, to give a sense of responsibility and bring the parents closer together," was unsuccessful in every one of these cases. Five had ended in divorce and all of the others were still "scrapping." Four of the mothers said that the child had only made a bad situation worse.

Some of the mothers expect nothing but perfect behavior from the children for whom they have so carefully planned. This produced another group of problem children.

Children who disappointed their parents by not being of the hoped-for sex made up a third group.

There were three times as many boys as girls among the patients. Girls are more likely to take refuge in submission and neurotic behavior while boys "act out" their troubles, suggested Dr. Sloman in her report to the *AMERICAN JOURNAL OF ORTHOPSYCHIATRY* (July).

*Science News Letter, October 2, 1948*

## MEDICINE

# More Effective "Shots"

New method with radioactive chemicals may increase the effectiveness of medicines given by hypodermic injections, according to results just revealed.

► **BETTER RESULTS** from medicines given by hypodermic injection may be had in the future as a result of studies with radioactive chemicals.

The studies, by Drs. Myron Prinzmetal, Eliot Corday, H. C. Bergman, Lois Schwartz and Ramon J. Spritzler of the Institute for Medical Research, Cedars of Lebanon Hospital, Los Angeles, are reported in the journal, *SCIENCE* (Sept. 24).

When they gave a "shot" of radioactive sodium into the muscles, half of it was absorbed in 30 minutes and almost 90% in one hour, they found. This period of time required for the chemical to be absorbed was much longer than would be expected from impressions gained in giving hypodermic injections to patients.

In the low blood pressure that follows shock from hemorrhage, absorption of radiosodium was slowed so that only about one-tenth as much of the chemical was absorbed in half an hour as was the case when blood pressure was normal.

The passage of radioactive chemicals through the chambers of the heart itself can also now be graphically recorded with

a specially constructed ink-writing Geiger-Muller counter, the scientists announce. It is this counter which gave the information about absorption times of hypodermically injected radiosodium.

In the heart studies, the radiosodium is injected into one of the veins of the fore-

arm and the radiocardiogram is made with a carefully shielded Geiger-Muller tube placed over the chest above the heart.

Since radioactive sodium has a short half-life of 14.8 hours and is rapidly eliminated by the kidneys, tiny amounts may safely be injected into the blood stream and allowed to flow through the heart. The amount of radiation with the dose given is much less than that which patients receive during various diagnostic X-ray examinations. More than 250 persons have been given injections without any bad results during the last year and a half.

"Blue baby" hearts, enlarged and failing hearts and blood circulation time have been studied with the new method.

Science News Letter, October 2, 1948

## PSYCHOLOGY

# Pups Get "Mental" Tests

► **THE MOST IMPRESSIONABLE** time of a puppy's life is when he is from four to ten weeks old—just after he gets his eyes open and before he is weaned. It is then that his later relationship to humans is determined, Dr. J. P. Scott, of the Roscoe B. Jackson Memorial Laboratory, told the meeting of the American Psychological Association in Boston.

A schedule for puppy care and development like that worked out by baby doctors for human infants is now being perfected at the Jackson Memorial Laboratory.

The puppies are given regular "mental"

tests of their activity and development and the way they behave toward their human associates. There are daily observations, weekly physical examinations, a standard system of feeding and veterinary care. Altogether 57 puppies have been studied intensively up to the age of 16 weeks and less intensively afterwards. The puppies belonged to 14 litters from seven pure breeds.

The Jackson Memorial scientists found five stages in the life of a dog, instead of the seven that Shakespeare credits to man.

1. The newborn—lasting from birth until the eyes open. This stage is two weeks and is spent in nursing.

2. From the opening of the eyes until leaving of the nest. It is then that the teeth erupt and the pups learn to walk. Special sense organs are used. Solid food is eaten and fighting play begins. This stage lasts from the second week until the fourth.

3. Leaving the nest until weaning—from the fourth week until the tenth. Now physical skill and activity increase. They indulge in playful fighting. There are great changes in relationships with human beings. Before and after this stage neither accident nor social training seems to have as much effect on how the dog turns out.

4. Weaning until sex maturity. This lasts from the age of ten weeks until eight to ten months. There may be gang attacks on one individual in play fights. The young dog is submissive to older dogs. They go hunting.

5. Maturity.

Science News Letter, October 2, 1948

## MEDICINE

# One Kind of TB Is Helped To Grow by Streptomycin

► **STREPTOMYCIN**, hailed as the best known drug for fighting tuberculosis, helps one kind of TB spread, instead of checking its growth.

Not only does one strain of the disease



**ALL-WEATHER FIGHTER PLANE**—This is the first flight photo of the Northrop XF-89, successor to the Black Widow F-61 night fighter. It has two jet engines, swept-up tail and wafer-thin wings and is capable of high speed. Radar-equipped, this glossy-black plane is capable of penetrating darkness, storm or fog. It is approximately 50 feet long and 15 feet high with a gross weight of over 30,000 pounds. It is manned by a pilot and radar observer.



thrive on the famed antibiotic, but it also may have a "partial dependency" on streptomycin for growth.

This startling effect is believed to have been discovered for the first time in human TB at the Veterans Administration Hospital (Lawson) at Atlanta, Ga. The case is reported in the PUBLIC HEALTH REPORTS (Sept. 3) of the U. S. Public Health Service by Drs. George A. Spendlove and Martin M. Cummings of the Public Health Service Tuberculosis Evaluation Laboratory; and Drs. William B. Fackler, Jr., and Max

Michael, Jr., of the hospital and the Emory University School of Medicine.

A patient was treated with penicillin for tuberculosis of the lungs at the VA hospital. He improved, but his saliva was still positive for TB germs. Streptomycin treatment was begun. After four months, the physicians described his course as "downhill."

They made laboratory tests with the strain of TB which the patient had. This kind of TB germs had its growth "markedly enhanced" by the antibiotic.

Science News Letter, October 2, 1948

## Well Balanced in Sciences

Science News Letter is an excellent publication and one that I would like to save. The content is well balanced with respect to various sciences and there is always something of interest to me. The Books of the Week section has become indispensable.—Robert Misch, Whiting, Ind.

## Good Reference Source

Science News Letter is a timely, well prepared magazine, which any man of science, layman or amateur, would be pleased to read and keep permanently for a reference source.—Capt. Walter White, Jr., 351 Infantry Communication Officer.

# Letters To The Editor

## Molds Development

Subscribing to SNL has been an important formative force in molding the development of my son now in high school and helping him direct and find himself.

Congratulations on this multiplied, I hope, one hundred thousand times throughout the youth of our great and scientific-hungry country.—M. M. Boston, Mass.

Besides Science News Letter and the other two personal subscription services, CHEMISTRY (monthly) and THINGS of science (monthly), Science Service offers every science teacher free affiliation of her science club or group with Science Clubs of America. This brings all the material necessary for a successful hobby study of sciences in or out of the classroom. We hope readers will encourage teachers, particularly in the high schools, to take advantage of this cooperation.

## Cain and Abel Version

I read your interpretation of the Cain and Abel incident (SNL, July 31). I have heard a somewhat different version and thought you might be interested in it.

Cain was the farmer. He had just broken the soil and found that agriculture on soil

that had not been tilled before was rather difficult. As a result, his crops were small; and his sacrifice was also small.

His brother, on the other hand, remained a shepherd and made a rather comfortable living from the good grazing lands. His large sacrifice was acceptable.

We can perhaps imagine Abel taunting his brother about his failure to please the Lord. Cain, who had worked harder and given more in proportion to his income than his brother, became angry and slew his brother.

Perhaps a moral for this day can well be drawn from the story. "Abel, where is thy brother, Cain?" has more meaning for us today than perhaps the traditional phraseology.—Bill Jackson, Madison, Wis.

There seem to be a number of such amplifications of the rather scanty account in Genesis. Another, from a California correspondent, is that Abel drove a flock of his sheep across Cain's field, ruining his crop—and the fight was on. Whether this actually happened long ago, somewhere just west of Eden, there is no doubt it has happened often enough elsewhere—with results as originally described in Genesis.

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How may pigs aid in polio research? p. 210

Photographs: Cover, Chicago Natural History Museum; p. 211, Northrop Aircraft, Inc.; p. 213, Firestone Plastics Co.; p. 214, p. 215, Westinghouse Electric Corp.; p. 218, American Museum of Natural History.

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MEDICINE

# Link Hot Foods to Cancer

**Drinking or eating very hot food may injure the lining of your stomach and predispose you to stomach cancer, which claims 45 percent of all cancer deaths.**

➤ A VERY HOT cup of coffee or other hot food can injure the lining of your stomach. And it may play a role in the origin of one of the most deadly forms of cancer, a scientist suggested.

Dr. Andrew C. Ivy of the University of Illinois indicted very hot foods at a meeting of the National Advisory Cancer Council at the National Cancer Institute in Bethesda, Md. The Council announced a new attack on the problem of gastric or stomach cancer. A national conference to study methods of fighting this killer is being called for Dec. 13-14 in San Francisco.

Food that has a temperature of 122 degrees Fahrenheit or more can damage the tender tissues of your stomach wall, Dr. Ivy explained. But in tests he conducted, some persons drank liquids which were as hot as 131 degrees or above.

The conference planned on gastric cancer will include papers by scientists whose studies may shed some light on whether hot foods are involved in this disease.

This form of cancer claims 45% of the deaths from all types of cancer. It is estimated that 90% of the patients who get it die within 18 months after it is diagnosed, Dr. John R. Heller, director of the National Cancer Institute, said.

"We are probably a long way from a gastric cancer cure," Dr. Heller cautioned. "But even with present methods many people who now die of cancer would stand a good chance if the disease could be caught early enough," he added.

There is still no effective method for mass screening of the population to detect this form of cancer. The fluoroscope has been used, but it has been dangerous because patients and doctors were exposed to large doses of radiation from this source.

Several projects to improve this method by reducing the danger from exposure are going on in institutions such as Johns Hopkins University and Westinghouse Electric Corporation. However, this method has several disadvantages. The numbers of people who would have to be surveyed would be tremendous. There are not enough physicians in the nation for such a project.

There is one hope with this method. It is believed that chronic irritation of the stomach predisposes a person to stomach cancer. Papers to be presented at the San Francisco conference will attempt to prove or disprove the theory that people who have little or no secretion of acid in their stomachs are likely to get the disease. If

true, this might mean that patients who develop duodenal ulcers, 75% of whom are known to have over-secretion of this stomach acid, may be immune.

If this theory is true, perhaps some other method can single out the people with little or no acid secretion. Then, only these persons would have to be given mass screening tests with the fluoroscope.

At present, the disease is more prevalent in men than in women. On the other hand, it is known that men secrete more acid than women, which seems to contradict the low acid theory. A reason for the sex difference in cancer may be that men are less careful in their eating habits, the scientists suggested.

Science News Letter, October 2, 1948

## TECHNOLOGY

## Plastic Cloth Promising For Tobacco-Raising Tents

➤ GREAT TOBACCO FIELDS in the Connecticut Valley, where thousands of acres of cigar wrappers are raised each year

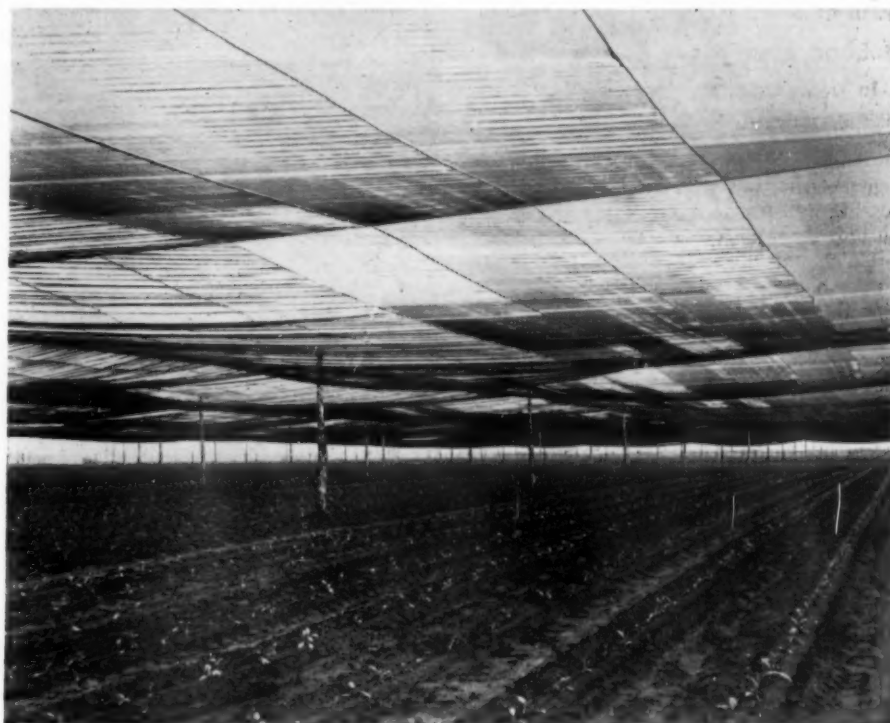
under "tents," have a promise of a new covering material. It is a plastic screening cloth, to replace the cheesecloth-like material used for the past decades.

The new material, which was tried on approximately seven acres this year, has finished its summer work successfully and is in condition for re-use probably several times. In this it differs from the cloth ordinarily used, which has little value after the end of a single season. Early tests also indicate that perhaps this plastic fabric provides a greater diffusion of light, permits a higher degree of moisture retention, and affords greater protection against frost. It is a Velon plastic and is a product of the Firestone Plastics Company, Akron, Ohio.

The Connecticut Valley tent or shade-grown tobacco is a Sumatra type of cigar wrapper tobacco that can not be grown successfully in New England in the open. The tents are flat coverings held aloft on poles and wires high enough to permit men and horses to work under them. They offer shade during the day, and hold in heat during the night. They also hold in moisture, and offer a degree of protection against storms and tobacco-destructive hail.

This Velon screening cloth may find other important applications in the agricultural and forestry fields. Among these are its use in raising shade-grown coffee and certain seedlings that need protection during their first season. Its first cost is higher than cloths now used but the fact that it can be used for several seasons will make it economical.

Science News Letter, October 2, 1948



**PLASTICS AID AGRICULTURE**—Open mesh screening cloth made of plastic is being used to protect an acreage of Sumatra-type, shade-grown tobacco at Windsor, near Hartford, Conn.



## PSYCHOLOGY

# Pattern for World Peace

Specialists gathered at the first International Congress on Mental Health explained how the world could avoid the disaster of another war.

By GEORGE GLENWOOD

Written from London

► DURING the past year in some 27 countries about 5,000 men and women, each a specialist in some phase of mental health or human relationships or both, focused their skilled attention on three questions which today are constantly on the minds of people everywhere:

"Can the catastrophe of a third world war be averted?"

"Can the peoples of the world learn to cooperate for the good of all?"

"On what basis is there hope for enduring peace?"

Recently some 2,000 of these social scientists met in London for the ten-day session of the first International Congress on Mental Health. They discussed the results of their year's work, and approved, by an almost unanimous vote, a number of recommendations prepared by their International Preparatory Committee. Before they disbanded they created a permanent World Federation for Mental Health to take up the torch of sanity and world citizenship in an attempt to light the way to world harmony and good will.

## Dubbed Idealistic

In some quarters these well-meaning, forward-looking social scientists have been labeled as impractical visionaries. Peace through mental health is all very good, say some people, but who is going to get the world to listen to idealistic proposals for curing the ailments of our sick society?

Unless the proposals of the social scientists can see the light of practical application they are not worth the thought it takes to formulate them. To obtain competent opinion on the future application of mental health principles to international good will and cooperation, four of the leading luminaries at the Congress were interviewed. Their answers reflect the full range of hope and despair with which the world may face the future.

The panel of experts was made up of:

Dr. Carl Binger, consultant to the Neuropsychiatric Division of the U. S. Veterans Administration, Editor-in-chief of *PSYCHOSOMATIC MEDICINE*, associate professor of clinical psychiatry at Cornell University, and speaker to the Congress on "World Citizenship and Good Group Relations."

Dr. Margaret Mead, assistant curator of ethnology at the American Museum of Natural History, New York, one of the world's foremost anthropologists, writer of

a half dozen books on primitive societies, consultant to the UNESCO Workshop for International Understanding and to the International Congress of Americanists, and Congress speaker on "Collective Guilt" and "The Individual and Society."

Dr. David Mitrany, adviser on international affairs to Lever Bros. and Unilever Ltd., for seven years assistant European editor of Carnegie Endowment's "Economic and Social History of the World War," author and lecturer on world citizenship and peace, and Congress speaker on "The Mental Health Aspect of World Citizenship."

Dr. John R. Rees, consulting psychiatrist to the British Army in World War II, Director of Medical Services at London's world famous Tavistock Clinic, President of the Congress and now first president of the World Federation for Mental Health.

The first question was: How will recommendations on mental health and good international relationships be brought home to the politician and statesman?

All four of the experts are in agreement that at present the social scientist is generally ignored by governmental agencies on the policy-making level. Yet that is just the

level where the social sciences can do the most to promote peace and serve mankind. Nor, thinks Dr. Rees, is there any immediate hope of getting governmental policy jobs for social scientists. He agrees with Dr. Mitrany that the social scientists must begin by winning public opinion to their side, since politicians must ultimately give ear to public opinion. Dr. Mitrany believes that social scientists can best win the attention of the public by first agreeing on and then putting forward a considered view "on the possible implications and effects of particular pieces of social legislation in regard to mental health."

## World Health Organization

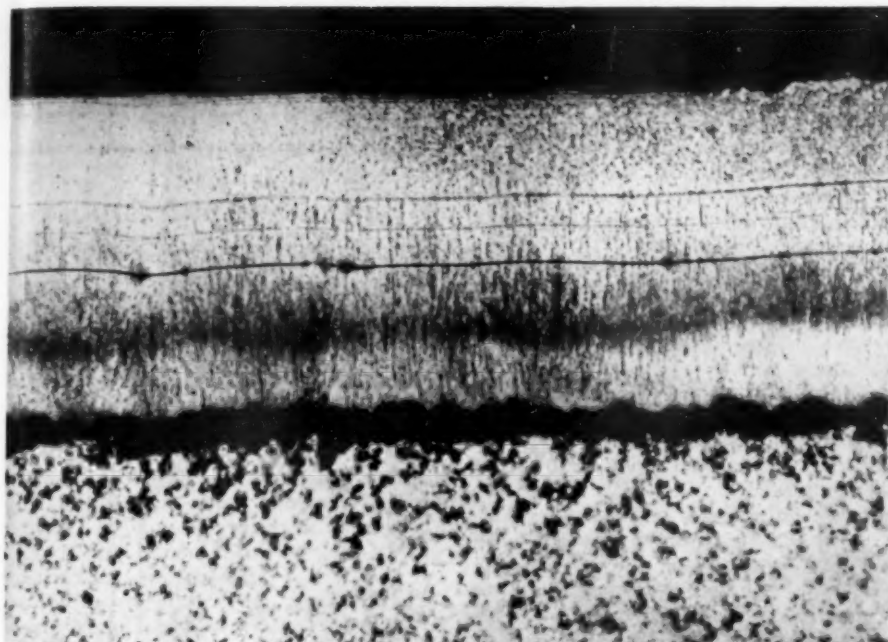
Dr. Binger and Dr. Rees are both of the opinion that one of the most promising avenues of international influence of the World Federation for Mental Health is through its association with the World Health Organization, which has 64 closely cooperating member nations, including Russia. Both Drs. Mead and Binger think that the personal influence of individual social scientists will gradually induce law makers, administrators, industrialists, etc., to give more serious consideration to principles of mental health. Dr. Mead also advocates attack at points of least resistance. "We must look for points of leverage," she says, "and use them to pry open the wall of resistance."

The second question was: Can a nation which is receptive to ideas of mental health and peace launch a national program of education for peace if its unreceptive neighbors continue to wax aggressive?

(Continued on Page 219)



**OLD COPPER PLATING METHOD**—This is a magnification of a cross-section of copper plated on a steel sheet by the old process. The ragged copper surface, which appears smooth to the naked eye, has to be buffed and polished before the nickel and chromium surface is plated on.



**NEW COPPER PLATING METHOD**—More efficient is this "periodic reverse" electroplating method which produces a smooth surface of copper. It was developed at the "luster laboratory" of the Westinghouse Electric Corporation, and practically eliminates the process of buffing and polishing.

## PSYCHOLOGY

## Drinking Girls Popular

Study of girls in a coeducational school indicates girls who drink are dated more than those who don't but there are more engagements among the non-drinkers.

► **COLLEGE GIRLS** who drink have more dates but fewer of them become engaged than non-drinkers.

A study made of 336 college girls in a coeducational institution showed this was an important difference between the two groups. The results were presented by Carol A. Hecht, Ruth J. Grine, and Sally E. Rothrock, under the direction of Dr. Jessie Bernard at the State College of Pennsylvania, in a report made to the *QUARTERLY JOURNAL OF STUDIES ON ALCOHOL* (Sept.).

They divided the women into five categories according to the frequency of drinking during the two-week period studied: women who never drank; infrequent drinkers, who had had nothing to drink within the last two weeks of the study; occasional drinkers who had drunk once in this period; near-regular drinkers who had had two drinks within this period; and regular drinkers.

This revealed that there were twice as many regular drinkers, a total of 90, as there were non-drinkers.

Other facts brought out by the study were:

The infrequent drinkers had begun to

drink in their 19th year while the regular drinkers started earlier, the average age being 17.

The girls who did little or no drinking attended church more often but the study was not conclusive on this point, the investigators stated.

Most of the young women who drank did so with the knowledge of their families.

Drinking and smoking among women have had similar trends, the investigators pointed out. They suggested that both were strongly supported by extensive advertising campaigns and upheld by motion picture models of behavior.

All these facts show a widespread change in middle-class standards, they said. The traditional tea party has given way to the cocktail party. This study, although limited, "represents a socially important group, namely college women," they said, adding "they come for the most part from middle-class homes and thus reflect middle-class standards."

They feel that this study of young women is significant because "their behavior probably indicates a trend of the immediate future."

Science News Letter, October 2, 1948

## ENGINEERING

## Better Coatings Studied In New "Luster Laboratory"

► **BETTER**, more lasting finishes for household appliances and other electrical products may come from a new "luster laboratory," now in operation at the Westinghouse Electric Corporation's East Pittsburgh Works.

Scientists in the new laboratory are working on problems of improving the finishes used to coat steel with gold, silver, nickel, copper and chromium. The last three are used on home appliances, while gold and silver have important applications in other electrical equipment.

Apparatus in the laboratory includes:

A surface analyzer which magnifies 40,000 times.

Gage to check the thickness of coatings which are as thin as one-fiftieth the width of a human hair.

Weighing device for objects half the weight of a common postage stamp.

Equipment to reproduce in the laboratory different types of climatic conditions to which finishes on electrical products might be exposed.

First achievement of the new study is a "periodic reverse" electroplating process which reduces the expensive job of buffing and polishing after the final coating, George Jernstedt, manager of Westinghouse electroplating operations, reported.

Science News Letter, October 2, 1948

## INVENTION

## Light Produced by Shaking In Newly Patented Lamp

► **A FLUORESCENT LAMP** that takes no electric current, but lights up when it is shaken, is the novelty on which U. S. patent 2,449,880 has been issued to James L. Cox of Ramsey, N. J. It is not intended to produce continuous illumination, but is considered better adapted to such purposes as signalling, use as an automobile tail-light, and special stage effects.

The lamp consists of a hollow glass vessel with the air exhausted and a low-pressure atmosphere of argon, neon or other inert gas sealed in. It contains also a small quantity of mercury and one of the luminescent pigments known as phosphors, such as are used now in the familiar fluorescent lamps.

This phosphor may either be mixed as a loose powder with the mercury, or spread on the inner wall of the lamp. In either case, it bursts into a glow when the mercury is agitated, and keeps on shining as long as the agitation continues.

Just what makes the light is not understood at present, the inventor admits. It is conjectured to be some kind of friction-electrical effect between the mercury and the phosphor.

Science News Letter, October 2, 1948



## BACTERIOLOGY

**Expect To See Viruses at Work with New Microscope**

► THE POSSIBILITY of seeing disease-causing virus at work in living cells is suggested by experiments with the new kind of microscope that uses contrast of phases in the light.

Dr. Robert Barer of Oxford University's department of human anatomy reported in the British scientific journal, *NATURE* (Aug. 14), that he has photographed the virus of parrot fever and smallpox vaccine. The viruses were unstained and mounted in water. These are among the larger viruses, but he has also observed living *Leptospira*, tiny organisms which cause some types of jaundice and the swamp fever of eastern Europe. *Leptospira* are said to be less than 0.15 microns or six millionths of an inch across.

The phase contrast microscope depends on contrast of dark and light to make small particles visible. First described about a decade ago by the Dutch scientist, Dr. T. Zernike, the phase-difference microscope has proved a boon to scientists who can now study living objects under high magnification. It brings out details without using stains which kill the cells.

Dr. Barer believes that still smaller viruses can be seen with the phase-difference microscope if an intense light source and a strong absorbing phase plate are used.

Science News Letter, October 2, 1948

## DENTISTRY

**You May Exert Force of 260 Pounds on a Molar**

► HOW WELL you chew your food can now be measured in pounds. Tests made on a group of people with normal teeth show that the force exerted can range from 14 to 260 pounds on a single molar, Dr. R. S. Manly, of Boston, Mass., reported to the American Dental Association, meeting in Chicago.

He suggested that the low chewing force exerted by some people is caused by pain or fear of pain rather than lack of muscle power. In support of this theory, persons with low chewing force had their dental tissues anesthetized. Fearing no pain, they showed a marked increase in chewing power, he said.

Science News Letter, October 2, 1948

## DENTISTRY

**Electron Microscope Finds "Cracks" on Teeth Surfaces**

► THE PROBLEM of decaying teeth may be licked soon with the aid of the electron microscope.

As a research tool it is opening up new avenues of research into the causes of one

of mankind's most widespread diseases, the American Dental Association was told in its meeting in Chicago.

This sensitive instrument has already revealed "cracks" on the surfaces of teeth which were not known to exist there before, Drs. David B. Scott and Ralph W. C. Wyckoff, of the laboratory of physical biology of the National Institutes of Health in Bethesda, Md., reported.

These cracks, moreover, have been eliminated as suspects in the beginning of the decay process because they were found present on both decayed and non-decayed surfaces of the teeth, the scientists reported.

These cracks will be the subject of further study on young teeth, both because they are more apparent on them than on old teeth and because caries is primarily a disease associated with the teeth of young people.

Science News Letter, October 2, 1948

## DENTISTRY

**Toothless Gums Still Need To Be X-Rayed**

► PERSONS who have lost all of their teeth still need to safeguard themselves against infection by having X-ray examinations, the American Dental Association was told in Chicago.

Studies have revealed that one out of every four patients with extracted teeth still has roots, unerupted teeth, cysts or other possible sources of infection present, according to Drs. LeRoy M. Ennis and Harrison M. Berry, Jr., of the University of Pennsylvania.

One survey made among 500 patients with no teeth or with a few teeth showed that 130 of them were wearing dentures with a possible source of infection underneath. Moreover, they had been doing so for about four and a half years, the dentists said.

Science News Letter, October 2, 1948

## AERONAUTICS

**New Turning Rule by CAA To Cut Plane Noise**

► GOOD NEWS for people living in the vicinity of major airports is a new ruling by the Civil Aeronautics Administration.

Shallow turns at altitudes lower than 500 feet are now permitted by the CAA. This will let pilots avoid some of the densely-populated areas near runways in taking off. It may result in less noise from low-flying planes in many localities.

Traffic patterns at three major airports—Newark, N. J., La Guardia Field, N. Y., and the Washington National Airport—have already been adjusted to keep the heavy, and loud, planes as far away as possible from congested areas, the CAA announced. Officials pointed out, however, that the CAA will not order airline pilots to make the low-altitude turns.

Science News Letter, October 2, 1948

**IN SCIENCE**

## VETERINARY MEDICINE

**Over-Use of Sulfa Drugs On Hens Cuts Egg Yield**

► SULFA DRUGS given to chickens to fight diseases may cost the flock owner half his birds' egg production, the American Veterinary Medical Association warned.

In one experiment, when 671 chickens were given sulfa drugs for periods of from three to six days, laying rate fell off 50% in one week, as compared with that of an untreated control group of 430 birds. Egg production in the treated group did not get back to normal for a month.

This is not intended as an argument against the use of sulfa drugs when needed, the Association emphasizes. However, it is felt that poultrymen should not be too ready to reach for the sulfa bottle.

Science News Letter, October 2, 1948

## METEOROLOGY

**Death Valley Proved To Be Hottest Spot on Continent**

► DEATH VALLEY in California is the hottest spot in North America.

From the temperature records of several decades, an Army meteorologist has come up with the following Death Valley heat records:

A top temperature of 180 degrees Fahrenheit may be expected on the desert floor in the valley one day in every seven years.

At five feet above the ground, where the official figures are taken, it was 134 above on July 10, 1913.

Top daily temperature was not under 127 degrees F. from July 7 to 14, 1913.

Coldest temperatures recorded at two different stations in Death Valley during the month of July were 69.11 above at one in 1936 and 68.26 at the other in 1938.

Arnold Court of the Office of the Quartermaster General, in a report to the American Meteorological Society, says that weather observations are getting more accurate all the time. But, he adds, no place else in North America is likely to break Death Valley's heat records.

The Death Valley studies showed that the surface sand or gravel has the highest temperature, with the temperature dropping as altitude is increased. Thus, when it is 160 degrees above zero Fahrenheit on the surface, it is 116 degrees five feet above the ground. And at 2,000 feet, it would be a mild—for Death Valley—92.

Mr. Court's studies are part of an Army research program aimed at development of clothing to protect soldiers in any climate.

Science News Letter, October 2, 1948



# WIDE FIELDS

## ENGINEERING

### Acids Not Friction Cause Auto Engine Wear

► THE ACTION OF ACIDS resulting from low-temperature operation is the major cause of automobile engine wear, Shell Oil Company research scientists declared.

When your car is used for short trips around town, with much starting and stopping, it is running "cold." Partially burned fuel gases and moisture result from this and attack the engine. It adds up to 90% of the wear on your car's engine, C. E. Davis, vice president in charge of manufacturing of the oil company, reported.

Laboratory studies and 2,500,000 miles of road testing were made by the scientists who discovered that acids rather than friction are the main enemies of long life for the motor in your car.

Science News Letter, October 2, 1948

## BOTANY

### Males Win Four to One On Form—in Poplars

► ON FORM, males are four-to-one winners over females—among cultivated poplar trees. This appears in studies made at the Harvard Forest in Petersham, Mass., by Scott S. Pauley, and reported in the journal, SCIENCE (Sept. 17).

Poplars belong to that minority of tree genera in which male and female flowers are borne on separate trees, instead of both on the same tree. An examination of 76 distinct strains of poplar grown in this country, all of which were originally selected for good stem form and general vigor and all kept true to type by propagating only by cuttings, showed that male lines or clones prevailed over female by a little more than four to one. Of eight popular lines similarly propagated in Europe, only two (exactly one-fourth) are females.

Science News Letter, October 2, 1948

## ICHTHYOLOGY

### Mackerel's Family Life Traced by Biologist

► MACKEREL have long kept their home life a deep secret, but finally an English scientist has found out about it. He is Dr. G. A. Steven, of the Plymouth Laboratories of the Marine Biological Association.

These fish, that figure so importantly in England's bill of fare, leave their inshore haunts in early spring and go out into deep water, at least a hundred miles west of the

nearest land. There they deposit their eggs at a depth of some 600 feet.

After spawning, the fish return shorewards and disperse all along the coastline, where they remain until late autumn. Then they disappear from the surface, and concentrate in widely separated spots on the sea floor. In early spring they come to the surface again, and prepare to repeat the cycle.

Science News Letter, October 2, 1948

## CHEMISTRY

### Quick-Setting Plastic Is Mineral-Filled

► A NEW MINERAL-FILLED plastic which is molded in a matter of seconds was announced by the Plaskon division of Libbey-Owens-Ford Glass Company in Toledo, Ohio.

Called alkyd molding compound, the new plastic is being used on electrical conductors, switch units and similar parts which are now in limited commercial production. First public exhibit of the new material was made recently at the National Plastics Exhibition in New York.

Plaskon alkyd is produced in granular form with natural light brown color, but a range of colors for the plastic is expected to be made available.

Science News Letter, October 2, 1948

## ENTOMOLOGY

### Leaf-Hoppers Are Carriers Of Elm-Tree Disease

► PHLOEM NECROSIS, an elm-tree disease even more deadly than the more widely publicized Dutch elm disease, can be carried from sick to healthy trees by leaf hoppers, small insects so inconspicuous that most people never notice them. This has been proved in experiments running back as far as 1940, now reported by W. L. Baker of the U. S. Department of Agriculture, who did his work at the Bureau of Entomology and Plant Quarantine laboratories in Columbus, Ohio.

Leaf-hoppers of two different genera were permitted to feed first on elm seedlings known to be diseased, then on healthy seedlings, all kept carefully in insect-proof cages. Necrosis was very slow in developing on elms infected by the bites of one of the two insect genera, taking as much as five years to appear. Development time was somewhat shorter in the case of the other insect's attack.

Further work is still in progress; but now that some definite knowledge of the disease carriers has been gained there is some hope of eventually developing counter-measures against this destructive shade-tree disease, known to exist from West Virginia to Kansas and from Iowa to Mississippi, Mr. Baker pointed out in the journal, SCIENCE (Sept. 17).

Science News Letter, October 2, 1948

## MEDICINE

### New Plastic Film Dressing Will Keep Wounds Dry

► YOU WILL NOT have to worry about getting your wound infected or your bandage dirty on the job if you wear a new plastic film dressing.

The new dressing is made of a nylon-derivative film. It is bacteria-proof, but at the same time it keeps the wound dry in spite of body perspiration. Experiments with the new dressing are reported in the British journal, THE LANCET (Aug. 7), by J. P. Bull, J. R. Squire and Elizabeth Topley, all of the Birmingham Accident Hospital.

They explained that the improved dressing is based on a wartime discovery. In the search for suitable clothing for tropical warfare, it was found that a material can protect against liquid from the outside, while allowing perspiration to pass through it in vapor form.

Advantages of the dressing are: the skin is kept dry; the wound can be inspected without lifting the nylon dressing, because the doctor can see through it; and there are fewer of the germs usually found on normal skin under this dressing.

To make the dressing waterproof, the scientists built a "window frame" of another plastic. One of these "window frames" coated with adhesive goes around the edge of the dressing, while the other frame sticks to the skin. The dressing will remain in place for days if the skin is free of grease and a heavy growth of hair. Workers using oil require additional protection, in the form of acrylic resin which is painted over the edges of the adhesive.

Clinical trial of the dressing for industrial and other wounds is now in progress, the scientists stated.

Science News Letter, October 2, 1948

## GENERAL SCIENCE

### Scientists in Reserve Get Research Projects

► SCIENTISTS who have uniforms in their clothes closets, ready for active service in an emergency, are now being given research and development projects during peacetime.

A new plan of the Research and Development Group of the Army's General Staff is funneling to officer reservists throughout the nation some projects and research jobs that the Army needs done under present conditions.

Local groups are being organized in the large cities and universities to plan and conduct the research projects and other reserve corps activities.

Reserve officers who are scientists are being encouraged to submit ideas and problems that they believe, from their wartime experience, will help the Army's defense program.

Science News Letter, October 2, 1948

PALEONTOLOGY

# Giant Birds Restored

Ancient extinct species of birds that couldn't fly but pursued their prey on foot, such as the monster called the Terror Bird, have been restored.

By DR. FRANK THONE

## See Front Cover

► BIG BIRDS are having their day in American museums just now. Birds ten feet tall. Birds with leg-bones that rival those of an elephant. Birds that could have chopped off your head with one snap of an enormous, trap-like beak. The biggest and most awesome birds that ever lived.

Fortunately for human peace of mind, they are all extinct. Especially that last number, the nightmare carnivorous monster shown on the cover of this week's SCIENCE NEWS LETTER that once lived in South America, and has been aptly nicknamed the Terror Bird. He is the deadest of the lot, having been extinct something like 11,000,000 years.

More formally, the Terror Bird is known to zoologists as *Mesembriornis*. Its massive bones, first found in Argentina nearly 60 years ago, show that it stood nearly as tall as a modern ostrich but was more heavily built. Its great beak, with a tearing hook

at the end, indicates plainly that it lived mainly on a diet of flesh.

Like all giant birds, both living and extinct, it could not fly, but pursued its prey on foot. Its habits probably resembled those of that modern American terror-to-snakes, the California road-runner, except that everything was scaled up to size: it could easily have done in a small alligator as its modern smaller counterpart devours a lizard.

The Chicago Natural History Museum has placed on display a lifelike restoration of this ancient monster-bird, assembled around wooden replicas of its bones and beak. Leon L. Pray, staff taxidermist, found that carefully saved pencil-sharpener shavings, mixed with casein paint, ground asbestos and chopped tow, made an excellent modelling mixture. Feathers were whittled out of balsa wood, and feet and claws from tulip-tree wood. Mr. Pray followed the coloration of the Terror-Bird's small-sized collateral descendant, the carima of Argentina and Brazil, in painting his restoration. As you look at it, you are glad that it isn't as alive as it looks—it might decide to snap at you.

Ten-foot-tall moa skeletons, approximately twice the height of the South American bird though nowhere nearly as formidable, were brought back by an expedition from New Zealand just in time to feature the formal opening of the new Sanford Hall of Biology of Birds at the American Museum of Natural History in New York. Moas have not been extinct very long; indeed, there is fair reason to believe that the last specimens were seen by the early Polynesian inhabitants of New Zealand, and perhaps even hunted by them.

The moa was not a bird to be particularly dreaded—unless he happened to kick or step on you. He was fairly closely related to the modern ostrich, and like the ostrich was not a flesh-eater, being content with a vegetarian diet varied with chunks of rock and assorted junk.

Five moa eggs have been found. Their original weight is estimated at nearly nine pounds. An egg like that would have fitted into Chesterton's description of Noah: "He ate his eggs with a ladle, from an egg-cup big as a pail."

At that, however, the moa's egg was only about half the weight of the egg of the great Elephant Bird of Madagascar, which was the biggest bird that ever lived. It has been extinct longer than the moa, but recently enough so that some of its eggshells and a few of its huge bones were

known even to the Arab voyagers of the Middle Ages. It was the original of the fabled Roc of the Arabian Nights tales, the bird that could fly off with an elephant clutched in each claw and a third in its beak.

Of course, the Elephant Bird couldn't fly; it was another giant ostrich, a third taller than present-day ostriches. Its thigh-bone was half a yard long, and its drumstick bone measured nearly 28 inches. Both were massive in accordance with the body-load they had to carry, so that it is no wonder that this gigantic fowl has been dubbed the Elephant Bird.

Since it will never be possible to invite any of these extinct bipeds to step on a platform scale, any figures for their once-living weight must be estimates. However, one American Museum ornithologist, Dean Amadon, has done a most ingenious job of estimating the weights of the two huge relatives of the ostrich.

Carefully measuring all important bones of the extinct birds, he has compared them with the corresponding bones of the modern ostrich, as well as with those of the ostrich-like birds of South America and the Australasian region. Comparing measurements of living birds with their known weight and filling in the "unknown" frame in the ratio, he arrives at a weight of nearly half a ton (965 pounds) for the Elephant Bird, and slightly over a quarter of a ton (520 pounds) for the ten-foot moa.

Science News Letter, October 2, 1948



**NEW ZEALAND MOA**—This ten-foot bird, closely related to the modern ostrich, was believed to have been last seen by early Polynesian inhabitants of New Zealand.



**ELEPHANT BIRD**—These are the bones of the biggest bird that ever lived. It was a giant ostrich, a third taller than present-day ostriches.



## World Peace

(Continued from Page 214)

Dr. Mead and Dr. Rees immediately took exception to the wording of this question. Neither one of them would accept the idea of receptive and unreceptive nations. They believe that all nations are receptive in some respects, unreceptive in others. Dr. Rees insists that even though the world is made up of nations of different ideologies, no nation incurs any risks in educating its peoples for peace since such education does not imply pacifism or laying down before aggression.

Education for peace, Dr. Mitrany agrees wholeheartedly, is not weakening but, in fact, strengthening to a nation. A people's appreciation of peace makes them resist only more strongly the aggressiveness of outsiders. The common practice of preparing for "so-called" defense by arousing fear in one's own people is psychologically neither a sound nor reliable mental foundation for the purpose of defensive war. By inculcating aspiration to world citizenship a government would make its people more conscious and, therefore, more resentful of the denial of that idea by other nations. Dr. Binger, on the other hand, questions the ability of a peace-inclined nation to concentrate on promoting peace when menaced by aggressive neighbors, since fear and anxiety frequently precipitate people into war.

The last question threw the bogies of war and revolt squarely in the laps of the experts: How are we going to get unreceptive nations to accept the ideals of peace through mental health and world community; must their peoples rise and overthrow them, or must we have yet one more war to force such nations into receptiveness?

## War No Solution

Here again there was opposition from Dr. Mead and Dr. Rees on the use of the terms receptive and unreceptive. But with one accord all four experts agreed that neither revolt nor war was any solution to the world's ills.

"Revolution or war is no way to get mental health," says Dr. Mead.

Dr. Mitrany points out that "One can not bludgeon people into accepting ideas." He goes on to say that our failure to achieve lasting peace so far is due not a little to the negative view of peace we have held—a mere absence of violence. When peoples begin to think of peace as something positive and continuous—an active campaign for the mutual good and benefit of all the people of the world—only then will peace become real and stable.

Though disclaiming any leanings towards pacifism, the experts expressed the view that "unreceptive" states could best be won over by example, cooperation and by winning their confidence. Dr. Mitrany's suggestion for gaining their confidence is by

developing positive joint international activities and services. Dr. Binger thinks that confidence can best be won through intellectual exchange on a level which does not involve political bias. He points out that several of our leading scientists have the confidence of their Russian counterparts. (But the atmosphere of vituperation and recrimination enveloping the recent World Congress of Intellectuals meeting in Wroclaw, Poland, does not seem to support Dr. Binger on this point.)

Dr. Rees believes we must undertake an international program of gradual, persistent education through all available means. Dr. Mead again stresses her belief that every society has its receptive points and that these are the ones to be attacked with all the socio-scientific vigor at our command.

But if, in spite of everything, war should come, then our civilization as we know it today is probably doomed. Another war, says Dr. Binger, will bring all the horrors of complete regimentation, all loss of individual freedom, excessive industrialization and, if not atom bombing, then something even more terrible—bombardment with germs causing every conceivable disease in man, his livestock and his crops.

That, then, is the situation as seen by four of the world's leading social scientists. Certainly it is not a rosy picture—these authorities are far too close to reality to be Pollyannas—but neither is it one of hopeless gloom.

Science News Letter, October 2, 1948

## METEOROLOGY

## Radar Navigation in Dust Storms Successful

► SAND AND DUST STORMS that plague shipping in the Persian Gulf hold no terrors for a radar equipped vessel, in the opinion of Master V. P. Marshall of the American S. S. Cornell. Vessel navigation in a dust storm is a new application of radar.

In the Red Sea, Arabian Sea and Persian Gulf sand and dust storms are frequent and visibility often cut to one mile, or less, for prolonged periods, he stated in a letter to Sperry Gyroscope Company, of Great Neck, L. I., who are makers of marine radar equipment. With our radar, he stated, no time has been lost by the vessel arriving at, or departing from, dust-shrouded ports.

Sperry's marine radar was developed primarily for use in sailing in foggy weather. It locates shorelines, islands and other vessels. Many installations of radar equipment made by various companies are in use on coastal vessels, ships on the Great Lakes, river boats and ocean liners. The equipment used is similar to the wartime radar on planes that helped locate enemy installations and the type used on shore to locate invisible enemy planes in the air.

Science News Letter, October 2, 1948

**"Body and Mind are  
One and Inseparable."**

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## Do You Know?

Heavy fires sometimes injure *shade trees* seriously by "cooking" growing tissues.

The American *sweetgum*, in the fall, may have colors from yellow through gorgeous red and crimson to dark purple.

Overall production of *building materials* during the first half of the present year exceeded the record-breaking production of last year.

American cheese, nonfat dry milk, peanut butter, canned tomatoes, tomato juice and concentrated orange juice are a few of the *foods* distributed under the National School Lunch act of Congress.

Foresters are selecting seed for growing *trees* with the same care that farmers select seed for their crops; there are strains of trees that produce better wood than do other strains of the same kind of tree.

Pinkish tan-colored fresh and frozen *shrimp*, now on the market, are not spoiled common shrimp but are a species known as grooved or brown or Brazilian shrimp, which is now being taken in unusual quantities from the Gulf of Mexico.



### MICROMAX CONTROL

Adds a Helper To The Research Team

In a research or control lab, such as is shown above, the man-hours required for temperature regulation of a furnace can be all but eliminated by the same kind of Micromax Program Control which industry uses on its giant furnaces.

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#### AERONAUTICS

## Radio Navigation System

► AIRCRAFT TODAY, with the newly designed Bendix radio navigation system, can tell exact position automatically while in flight, it was revealed in Cleveland at the National Air Races which include the Bendix long-distance event with a take-off from Long Beach, Calif.

A "fix" can be read by the pilot on a meter at any time and any place during flight as easily as the automobile speedometer is read, according to Howard K. Morgan of the Bendix Radio Division. Also new electronic devices used in Ground Controlled Approach apparatus aid landing with precision and safety, regardless of weather.

For higher speed aircraft, both in landing and in flight, the accent is on better and more reliable radio instrumentation and communication. Very high frequency (VHF) waves are replacing the low and medium frequencies long used. The advantage is static-free communication, which means that a pilot can understand communications from the ground while in storm areas, the time when he needs to hear best. Airports operated by the U. S.

Civil Aeronautics Administration are being rapidly equipped with VHF apparatus. So also are the radio ranges which guide pilots along the air routes.

The new VHF Omni-Directional Ranges already installed by the CAA throughout the country provide facilities never before available in radio ranges. The design of the Bendix NA-3 Navigational System makes these available to the pilot with great convenience and reliability. The frequency range used eliminates not only the atmospheric static but also what is known as precipitation static caused by rain, snow or dust.

More communication channels are available in the Very High Frequency band than in the lower frequency band. There is less interference between channels since the transmissions do not extend beyond "line of sight" distances. The Omni-Directional Range is not limited to two or four courses, but will supply accurate information on any course to the station the pilot may select. This accounts for its name, Omni-Directional.

Science News Letter, October 2, 1948

#### CHEMISTRY

## Oil Recovery Progressing

► BITUMINOUS SANDS of Alberta, a great untapped source of fuel oil and gasoline, are gradually yielding to research scientists trying to find an economical process for the extraction of their petroleum. The research is being undertaken both by the Canadian government and the Research Council of Alberta, located at the provincial university, Edmonton, Canada.

The so-called Athabasca tar sands are in a 10,000-square-mile area north of Edmonton. Estimates vary on their petroleum content but it has been placed as high as 250,000,000,000 barrels. There is no question regarding the possibilities of extracting oil from them; the problem is to find a way at a low enough cost.

A government-sponsored separation plant is being erected at Bitumount on the Athabasca river. It contains a hot water separation unit designed on the results of researches of the Alberta Council. The recovery of oil by the hot water separation process is from 80% to 90% from good grades of sand. Water-flooding of the sands in place is a promising method of oil recovery.

Work has continued during the past year on applicability of water-flooding to the bituminous sands, an annual report of the council, just issued, states. Measurements of the viscosity of the bituminous sand oil and of the viscosity-temperature relationship show that the viscosity de-

creases very rapidly as the temperature rises above 32 degrees Fahrenheit to about 100 degrees. It decreases slowly above 150 degrees.

It can be said with considerable definiteness, the council asserts, that the viscosity of the bituminous sand oil at formation temperature is too great for water-flooding, and that a successful application of this method of oil recovery will involve the heating of the sand beds, in place, to temperatures above 100 degrees.

Water under practicable pressures will flow through bituminous sand at 36 degrees Fahrenheit, and will displace oil. The flow of oil is small, however. At 150 degrees, on the other hand, the flow is usefully great and half the oil is displaced before the ratio of water to oil in the flow becomes unduly high.

Science News Letter, October 2, 1948

#### RADIO-ASTRONOMY

## Meteors Enable Us To Hear Distant Programs at Night

► MILLIONS of tiny meteors entering the earth's atmosphere may be responsible for our ability to receive radio broadcasts from long distances during the night, states Dr. A. G. McNish of the National Bureau of Standards.

Radio waves, which travel in straight



lines, must be reflected back to the earth if they are to be heard at any great distance. Tiny electrified particles in the ionosphere bounce the short waves back to earth.

The ions that compose this reflecting layer are produced mainly by the action of the ultraviolet in sunlight which splits electrons off the atoms and molecules high up in the rarefied air. Some of the electrical particles may also be produced by impact of tiny corpuscles shot off from the sun, some by cosmic rays and some by meteors.

The lower portion of the ionosphere is rich with free electrons during the day due to the action of sunlight, Dr. McNish pointed out at a General Electric Science Forum. Directly after sunset most of the electrons are gone because they become recombined with molecules.

"Yet—and herein lies the mystery—a

sufficient number of electrons persist at this lower height all through the night to reflect radio waves," Dr. McNish said.

"Judging from the rate of electron-decay just after sunset, one would not expect to find any significant number beyond midnight."

Meteors may be the agency responsible for reflecting the radio waves at night. Astronomers estimate that more than a thousand billion of these particles, smaller than grains of sand, enter the earth's atmosphere during a 24-hour period. Travelling at speeds up to 200,000 miles per hour, they would smash violently into atoms and molecules of the upper air. These meteors would tear some of the electrons from these particles to which they belong and thus maintain the radio roof throughout the night.

Science News Letter, October 2, 1948

#### ENGINEERING

## More Mileage Per Gallon

► TOMORROW'S AUTO engine is going to give 25% more miles per gallon and you will be filling up at the gasoline pump on such high-compression fuels as triptane, toluene, benzene and trimethylpentane as well as superleaded "gas."

The American Chemical Society was told in St. Louis by leading petroleum chemists that new fuels for more efficient engines can be ready by the time the automotive engineers can build, test and produce them commercially.

Since 1930 the efficiency of fuel utilization in passenger cars has increased by more than 30%, John M. Campbell and Dr. Lloyd L. Withrow of the General Motors Research Laboratories, Detroit, told the chemists. In addition to this improvement, high-compression ratio engines combined with high-octane gasoline of early-war aviation grade could push the efficiency 45% further.

Today's auto engine wastes 75% to 80% of the gasoline's energy and a gain of only 1% would save one to two millions of gallons of gasoline daily in the United States.

Present commercial gasolines sold at filling stations range between 70 to 90 octane and engines of newer passenger cars have compression ratios of about 7-to-1.

Sizable saving would occur with 8-to-1 engines and gasoline in the 96 to 98 octane range, a grade that the petroleum industry could produce to the extent of about 20% of its total gasoline volume.

Push the compression ratio up to 12 and 15-to-1, and new fuels chemically tailored by the newer methods of refining will be needed.

Experimental engines using these new fuels have been built and given road tests, several research groups reported.

The higher the compression ratio the better the antiknock quality of the fuel needed, R. W. Scott, G. S. Tobias and

P. L. Haines of the Standard Oil Development Co., Elizabeth, N. J., concluded.

Any upgrading of the fuel quality of auto engines should be established sufficiently ahead of the engine production so that the refiner can develop his methods of production. This was suggested by W. C. Offutt, J. E. Taylor and G. B. Swartz, Jr., of Gulf Research and Development Co., Pittsburgh.

Superfuel of 100 octane for the new engines of the immediate future can be made by adding a teaspoonful of tetraethyl lead to gasoline, Dr. H. A. Beatty and Dr. W. G. Lovell of the Ethyl Corporation, Detroit, told the chemists.

Science News Letter, October 2, 1948

#### MEDICINE

## Temperature of Joints Taken with New Method

► THE TEMPERATURE OF JOINTS crippled by disease has been obtained by the use of a technique applied for the first time to man, the American Congress of Physical Medicine was told in Washington.

A needle from which the syringe is removed is inserted into the anesthetized joint. Then tiny temperature measuring units are threaded over this needle and are inserted two to three inches into the inner recesses of the joint.

This means that for the first time doctors will know what effect any treatment being used has on the crippled joint, Drs. Joseph L. Hollander and Steven M. Horvath, of the School of Medicine and Hospital of the University of Pennsylvania, pointed out.

"It appears significant," they reported, "that cold, pain, fear and even smoking produce an identical effect, i.e., the apparent constriction of the skin vessels and dilation of the vessels within the joints. Perhaps this observation may lead to an

explanation of how such factors aggravate or may even precipitate an arthritic process."

These studies were made on a group of 25 patients, of whom 21 had some form of arthritis. Tests showed that skin temperatures were fairly normal while joint temperatures were definitely elevated in cases of degenerative joint disease, chronic gout, and infectious arthritis.

This method is therefore of use in following the course of joint diseases and in evaluation of the effects on the joint temperature of such treatment as rest, exercise, physical therapy, drugs and X-rays.

Science News Letter, October 2, 1948

#### PSYCHOLOGY

## Brain Operation Found To Reduce Intelligence

► REDUCTION of intelligence has been noted following a certain brain operation now sometimes used for epilepsy, it was reported to the American Psychological Association in Boston by Dr. Robert B. Malmo, of McGill University, Montreal, Canada, and the Allan Memorial Institute of Psychiatry.

The operation is one called gyrectomy

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and involves the removal of one of the convolutions of the frontal lobes of the brain.

Seven cases in which bilateral frontal gyrectomy was performed were studied as well as eight other cases in which another brain operation, lobotomy, was used. In lobotomy, the nerve connections between certain parts of the brain are cut.

A consistent drop in general intelligence, as measured by a standard mental test, the Wechsler-Bellevue Intelligence Scale, was found following the operations. There was a significant drop in ability to define words.

These cases, Dr. Malmö said, offered an excellent opportunity to study the effects on intelligence of these types of brain operation, because the patients had not

reached a state of personality deterioration before the operation.

Contrasted with Dr. Malmö's findings on the effects of the brain operations was the report by Dr. Lucille B. Kessler, of Traverse City State Hospital, Mich., on the effects of electric shock therapy on the intelligence of patients with the mental disease schizophrenia.

The 20 patients studied by Dr. Kessler were actually much more intelligent after the treatment than they were when they first entered the hospital.

The reduction in bizarre and incongruent thinking, the better attention of the patients to the test and their increased social awareness were, Dr. Kessler believes, important in producing the much better mental test scores.

Science News Letter, October 2, 1948

#### DENTISTRY

## Overeating Harms Teeth

► **OVEREATING** is harmful to your teeth as well as to your figure, Dr. John H. Greene of Philadelphia warned the American Dental Association meeting in Chicago.

The perpetual muncher, who must have a midnight snack, or candy all day long, will usually have the most dental troubles, he pointed out.

Sweet desserts are also bad for you unless they are fruit or raw food, he said, because they reawaken your appetite. Raw foods, on the other hand, are good for you because they clean the surface of your teeth.

We know what is good for us, Dr. Greene asserted, but we continue eating only what we like. "We are too indolent to change or add to our good list unless sickness makes it imperative," he declared.

Science News Letter, October 2, 1948

## Caries Despite Vitamins

► **THE POPULAR BELIEF** that a deficiency of minerals and vitamins in the diet will lead to tooth decay was debunked at the same meeting by Dr. Hamilton B. G. Robinson, of the Ohio State University College of Dentistry.

"It can be agreed that certain minerals

are important for formation of sound teeth but there is no clearcut scientific evidence that those minerals are necessary to prevent disease in mature teeth," he declared.

He termed misleading those studies that tried to show that decay is hastened by certain diseases or deficiencies. The investigators overlooked the fact that individuals who are of comparable age, race, region of residence and social status have the same tooth decay problems, he charged.

Dr. Robinson admitted the value of vitamin treatment in deficiency diseases such as scurvy and rickets, but vitamins as a weapon against dental disease he termed a case of firing "broadside at an unseen target."

Science News Letter, October 2, 1948

#### ASTRONOMY

## Comet Ashbrook Probably Old Periodic Comet

► **FAINT COMET ASHBROOK**, 12th magnitude when found August 26 in the constellation of Aquarius, the water carrier, is probably an old periodic comet following a new path. (See SNL, Sept. 18).

It passed quite close to the planet Jupiter—within about 28,000,000 miles of it—in 1945, preliminary calculations by Dr. Leland E. Cunningham of Students' Observatory, University of California, show. At that time its orbit must have been considerably changed, he points out, which would account for failure to discover it earlier.

Further observations are needed before this comet can be definitely identified with Barnard's, Holmes' or other lost periodic comets.

"If the present orbit is approximately correct," Dr. Cunningham stated, "and if the comet does not fade unusually fast, it should be visible throughout its orbit."

Science News Letter, October 2, 1948

#### GENERAL SCIENCE

## A.M.A. Says Health Plan Is Not Satisfactory

► **THE American Medical Association's** answer to the Federal Security Administration's ten-year program for the nation's health is that the "prescription" written by President Truman and F. S. Administrator Oscar Ewing would, if taken by the United States, prove more nauseating than curative (See SNL, Sept. 11).

Calling the statistics on which the 10-year plan is based "the same old figures that the proponents of government medicine have been launching at periodic intervals for the last 20 or 30 years," the editor of the JOURNAL OF THE A.M.A. (Sept. 25) states, in part, as follows:

"The amount of medical care that is given to most people of the world under their compulsory sickness insurance plans would never satisfy the people of the United States. The inevitable faults of these systems, which have been emphasized to the American physicians and to the American people for a good many years, are now coming vividly to light. Great Britain embarked in its new National Health Act on July 5. People in England may now go to the doctor without calculating the cost of the service. They may be supplied with spectacles and teeth without additional costs. They may have consultants and beds in hospitals without reference to individual payments for services rendered. That is what the National Health Act of Great Britain promised them. Do you think that they get it? No, indeed! They queue up to see the doctors formerly they could have seen by appointment. The doctors write formulas and prescriptions and reports many hours in advance of the time when they see the patients because otherwise they would never have time to see the patients. Many a physician is already satisfied that he cannot work under the Act. The unfortunate public have no way of knowing whether or not what they get is good medical service or something to make them think that they are being given attention.

"The greatest folly in the world is the manner in which Great Britain embarked on a nationwide health service without hospitals, doctors, nurses, drugs or money to supply what they promised, and an even greater folly would be the attempt to offer a similar service in the United States and to gulp the entire medical problem of the nation in a single swallow. Should the United States accept the prescription by President Truman and his consultant, Mr. Ewing, it would likely discover that the prescription had little of curative value and a great deal of the ultimate effect of ipecac or apomorphine (these, Mr. Ewing, are classified by the books on drugs as emetics)."

Science News Letter, October 2, 1948

Plastic Coasters and Tiles

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# Books of the Week

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THE ADVANCEMENT OF SCIENCE, Vol. V, No. 18—British Association for the Advancement of Science, 77 p., paper, \$1.50 approx. Special issue devoted to the meeting of the British Association at Brighton.

BRITISH AGRICULTURAL BULLETIN, Vol. One, Number One—British Council, 40 p., illus., \$5.00 a year, single copies \$1.50. Intended "to put British knowledge and experience at the disposal of the farmers of other countries."

A CHRONOLOGY OF SCIENTIFIC DEVELOPMENT 1848-1948—K. Lark-Horovitz and Eleanor Carmichael—American Association for the Advancement of Science, 99 p., paper, free from Physics Department, Purdue University, Lafayette, Ind. Covering major achievements of the last century compiled for the Centennial Celebration of the AAAS.

CODES AND SECRET WRITING—Herbert S. Zim—Morrow, 154 p., illus., \$2.00. This book is not for the expert but just for fun; it covers common codes, breaking secret codes, secret languages, and invisible writing.

THE FLINT RIVER SITE—William S. Webb and David L. DeJarnette—Alabama Museum of Natural History, 87 p., illus., paper, 6 cents direct from publisher at University, Ala. Along the Tennessee River in Alabama there are some 340 shell mounds, remains of the oldest people in this region.

FRONTIER DOCTOR: The Autobiography of a Pioneer on the Frontier of Public Health—Samuel J. Crumrine—Dorrance, 284 p., \$3.00. The story of a physician who started his practice in the Cowboy Capital, Dodge City, Kansas, and led many a battle against the causes of the spread of disease such as the common drinking cup, the fly, and the roller towel.

THE LUNGFISH, THE DODO, AND THE UNICORN: An Excursion into Romantic Zoology—Willy Ley—Viking, Rev. ed., 361 p., \$3.75. A scientist distinguished for his experiments on rockets and his speculation about interplanetary travel makes a trip into a land of legend, imagination and zoological fact.

THE NEW BOOK OF FLIGHT—C. H. Gibbs-Smith—Oxford University Press, 288 p., illus., \$5.00. Beautifully illustrated with photographs is this review of modern developments in aviation with special emphasis on

British achievements. Has sections on rockets, jet propulsion and helicopters.

OUTLINES OF PHYSICAL CHEMISTRY—Farrington Daniels—Wiley, 713 p., illus., \$5.00. Material for a first course in physical chemistry which originated at the University of Wisconsin. Emphasis is on practical examples.

RADIO STATION MANAGEMENT—J. Leonard Reinsch—Harper, 177 p., illus., \$3.50. Beginning with "How to Get a Radio Station," there is discussion of many of the problems of running a station including programs. The place of radio in education is given attention.

SCIENCE ADVANCES—J. B. S. Haldane—Allen and Unwin (Macmillan), 253 p., illus., \$3.00. A group of essays on topics as widely varied as the interests of the author and with his characteristic charm of expression.

SOCIAL ADJUSTMENT IN OLD AGE: A Research Planning Report—Otto Pollak with the assistance of Glen Heathers—Social Science Research Council, 199 p., paper, \$1.75. Discussing problems of interest to all except those who expect to die young.

YOUR SCHOOL DISTRICT—National Commission on School District Reorganization—Department of Rural Education, National Education Association, 286 p., paper, \$2.00; board, \$2.50. Of particular interest to schoolmen and those interested in school organization.

Science News Letter, October 2, 1948

## ARCHAEOLOGY

### Indian Shelter Shows 2,000 Years of Culture

► TWO THOUSAND YEARS of Indian history are represented in five feet of dirt in a rock shelter in West Virginia.

Stages in the growth of Indian culture from the beginning of the Christian to colonial times are shown in materials and tools left by the inhabitants of this shelter in the New River Valley. It was uncovered by an archaeological survey led by Ralph S. Solecki of the Smithsonian Institution.

This survey is exploring a valley in West Virginia to save as many of the relics of Indian and colonial history as is possible before the region is flooded by the Bluestone reservoir. The survey is a co-operative project of the Smithsonian, the National Park Service and the Corps of Engineers, Department of the Army. The area will be flooded in a few months.

The scientists discovered 42 Indian sites in the reservoir area. They consisted of village and camp remains, several earth and rock mounds, rock shelters and the locations of four forts built by white settlers. These forts, erected in the early 1770's, were used in the border warfare of the period.

The New River Valley area might be

considered the "Mason-Dixon" line of the eastern Indians—the border between the Iroquois on the north and the Cherokee on the south. The "Great Indian War-path" passed through the valley. Iroquois traveled this route in their raids on their southern enemies, the Catawbas.

Science News Letter, October 2, 1948

## ICHTHYOLOGY

### Shad Seem To Know Their Way Home, Study Reveals

► SHAD seem to know their way home, no less than the better-publicized salmon. Such is the indication of fish-tagging experiments reported in SCIENCE (Sept. 24) by Edgar H. Hollis of the U. S. Fish and Wildlife Service.

In 1941 he attached identifying tags to 2,466 young fish, mostly shad, which were later released in the Albemarle Sound region of North Carolina. The tags carried an offer of a one-dollar reward for return to the Fish and Wildlife Service.

Only three tags have thus far been returned, but they were all from fish taken within a ten-mile radius of the original "home" waters of the released young fish.

Science News Letter, October 2, 1948

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☼ **COMBINATION BROOM** and mop, recently patented, has what might be called a divided skirt which fits over the straw, split on one side so that the device may be used for sweeping. With the skirt closed, the combination may be used for mopping and scrubbing. The mop-cloth covering can be removed and washed.

Science News Letter, October 2, 1948

☼ **FISHING LINE** drying reel, a collapsible type that fits into a pocket-size case, can be opened and used anywhere without a fixed means of support. It has a fixed blade attached to a shaft and two blades which are set to rotate around the shaft. Braking means to prevent backlash in winding is provided.

Science News Letter, October 2, 1948

☼ **CAN CRUSHER** enables housewives to flatten emptied fruit and vegetable containers before disposal in the trash receptacle. This recently patented collapsible device, which may be fastened to a door-jamb, has two plates to hold the can, the upper one being movable downward with the help of a lever arm.

Science News Letter, October 2, 1948



☼ **PENICILLIN** can be inhaled in dry powder form by means of the transparent plastic device shown in the picture. There is also an interchangeable, dual-opening attachment to permit inhalation through

the nose. Penicillin powder is supplied in sealed, one-dose cartridges.

Science News Letter, October 2, 1948

☼ **MASTER KEY** to the study of musical scales is a business-letter-sized paper chart with a piano keyboard diagram at the top and a revolving dial below which can be turned to show the major scale of various keys. Information helpful to the beginner is printed on the chart.

Science News Letter, October 2, 1948

☼ **EXPOSURES OF MICROFILM** are automatically timed by an electronic device that takes account of the light and the condition of the record being photographed for use or preservation. The exposure is prolonged until enough light has reached the film to give the proper exposure.

Science News Letter, October 2, 1948

☼ **ELECTRICAL RECEPTACLE**, a locking plug-in type which children can not short circuit with wires or pins, is easily removed by a slight turning movement but can not be disengaged by a direct pull on the electric cord. This recently patented device has a contact spring fixed midway between the opposite ends of its base.

Science News Letter, October 2, 1948

# • Nature Ramblings by Frank Thone •

► **WINTER** imposes a double strain on plants' survival capacities. Cold we think of readily enough; it is after all the most obvious thing about winter. To survive cold, plants must either keep their temperature above the freezing point of water, or they must prepare to endure freezing. More than that, they must be able either to prevent or to endure the repeated formation and thawing of ice crystals in their survival-organs, because every time water enters or leaves the ice-crystal state it expands powerfully, with resultant tearing effect on the tissues.

The other strain imposed by winter is that of drought. Exposed parts of plants must stand the buffeting of winds that are often very dry, and that will suck out every molecule of water the plant tissues release. In the West especially this is often a cause of great anxiety to winter-wheat growers. It is also one of the reasons why relatively little orchard planting is done in the Great Plains area.

In general, plants do not "keep warm under a blanket of snow and dry leaves,"

## Survival in Winter



kindergarten rhymes to the contrary notwithstanding. Plant buds at ground level, rosette plants just above it, rhizomes and other storage-and-survival organs below ground, all become pretty cold when zero weather comes—almost as cold as the upper air. One thing the snow-and-leaf covering does for them, however, is slow down temperature changes and minimize their scope. Once cold, they stay cold, escaping the dangerous freeze-thaw-freeze fluctuations that would otherwise be imposed by the weather. The cover also prevents most

of the dessication that would otherwise take place.

More important even than ground cover is the state of the plant juices themselves. In survival-organs, whether buds or seeds, moisture does not exist in the thin, sappy state familiar in the softer summer condition of the plants. During the autumnal process of maturing or "hardening," much of the water goes out, leaving the complex solutions of sugars, proteins and mucilage-like substances much denser. And as any first-year chemistry student will tell you, the denser such solutions are the harder they are to freeze.

Fuzzy or varnish-like coverings on buds of woody plants are much more useful in checking evaporation from the little knots of leaf- and flower-beginnings within than they are in keeping them warm. They are also useful in preventing the intrusion of moisture during the winter rainstorms that subsequently freeze into glaze ice, an especially trying form of winter stress on plants.

Science News Letter, October 2, 1948